

(No Model.)

2 Sheets—Sheet 1.

H. H. JONES.

COMPRESSOR.

No. 376,598.

Patented Jan. 17, 1888.

Fig. 1.

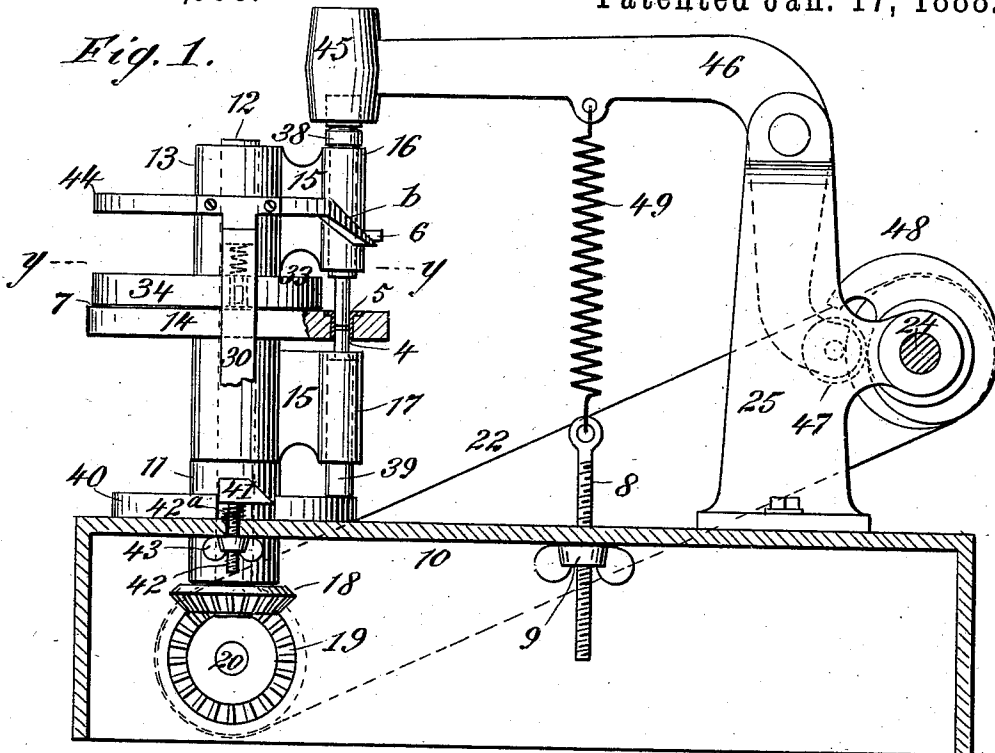
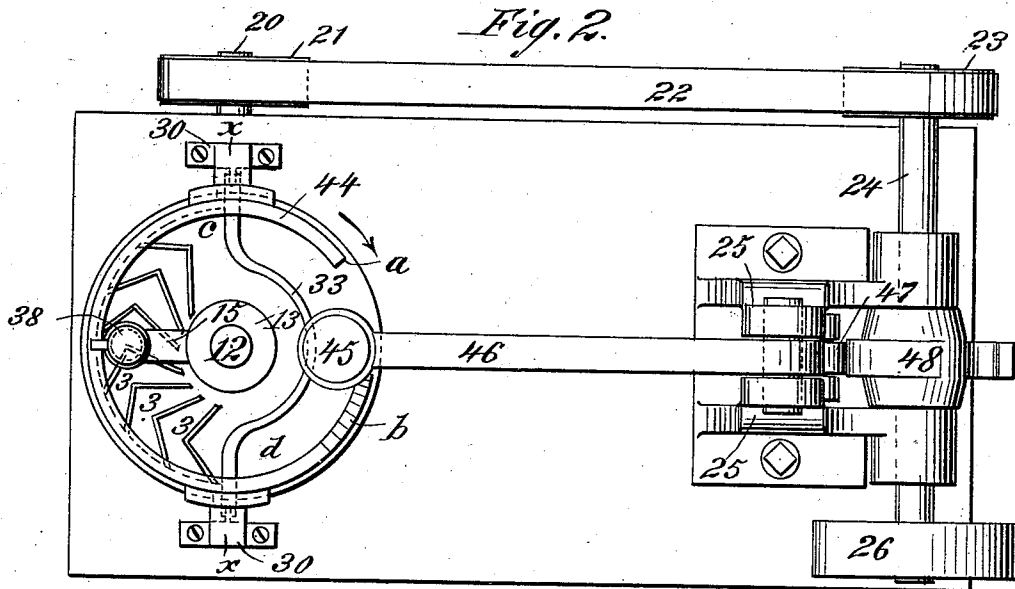


Fig. 2.



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Fig. 3.

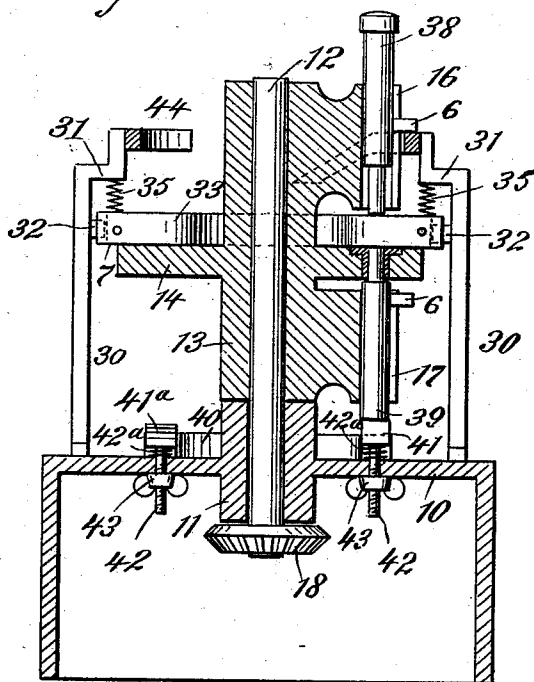


Fig. 4.

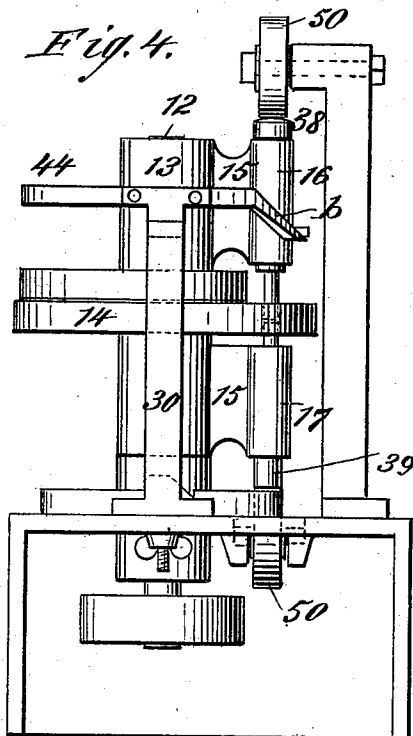


Fig. 5.

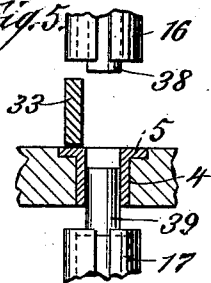


Fig. 6.

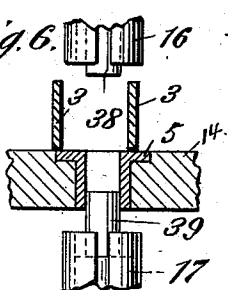


Fig. 7.

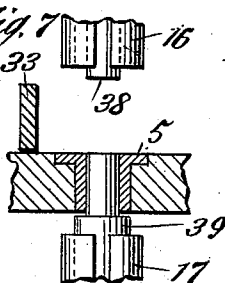


Fig. 8.

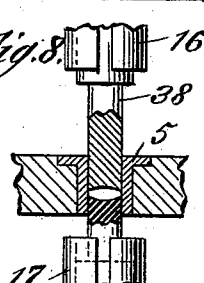


Fig. 9.

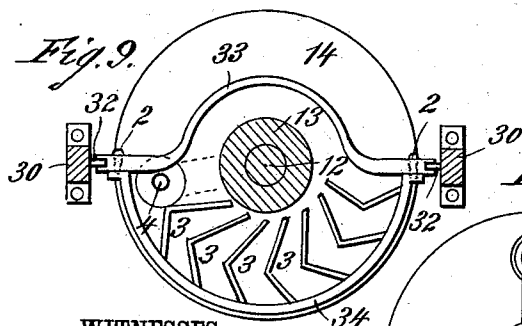


Fig. 10.

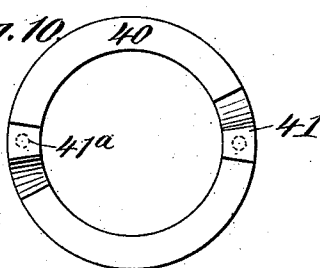
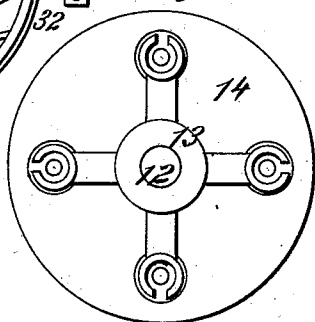


Fig. 11.



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UNITED STATES PATENT OFFICE.

HARRY H. JONES, OF LANCASTER, NEW HAMPSHIRE.

COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 376,598, dated January 17, 1888.

Application filed January 21, 1887. Serial No. 225,023. (No model.)

To all whom it may concern:

Be it known that I, HARRY H. JONES, of Lancaster, in the county of Coos and State of New Hampshire, have invented a new and Improved Compressor, of which the following is a full, clear, and exact description.

This invention relates to a novel form of machine adapted for use in compressing dry or nearly dry powdered substances into solid form, the machine being applicable for use in many branches of the mechanic arts, but being more especially designed for the use of druggists in the making of what are commonly known as "compressed tablets."

The invention consists, essentially, of an automatic measuring mechanism and an automatic compressing mechanism, the two mechanisms being combined in a manner to be hereinafter more fully described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side view of my compressing-machine, the supporting box or bed and a portion of the revolving disk being shown in section. Fig. 2 is a plan view of the machine. Fig. 3 is a cross-sectional view taken on line $x x$ of Fig. 2. Fig. 4 is a side view of a portion of a modified form of machine. Figs. 5, 6, 7, and 8 are detail views illustrating the various positions assumed by the compressing-plungers as the disk revolves. Fig. 9 is a sectional plan view taken on line $y y$ of Fig. 1, the parts, however, being shown in a different position from that in which they are illustrated in Fig. 1. Fig. 10 is a view of the cam-ring and the adjustable cam-sections employed in connection with the lower compressor-plungers; and Fig. 11 is a view of a construction wherein a number of sets of compressor-plungers are employed instead of a single set of such plungers, as in the case of the construction illustrated in the first four figures of the drawings.

In constructing such an apparatus as the one illustrated in the drawings above referred to I provide a base-plate or case, 10, which is formed with a vertical tube, 11, within which there is mounted a shaft, 12, to which there is

keyed a sleeve, 13, that is made integral with a disk, 14, and with arms 15, vertically-slotted tubes 16 and 17 being formed at the extending ends of the arms 15.

To the lower end of the shaft 12 there is secured a bevel-gear, 18, that is engaged by a corresponding gear, 19, which is carried by a short horizontal shaft, 20, said shaft being in turn provided with a pulley, 21, over which there is passed a driving belt or chain, 22, that runs in engagement with a second pulley, 23, of the same diameter as the pulley 21, which said pulley 23 is carried by the main power-shaft 24, said shaft being supported in bearings carried by a double standard, 25, the shaft 24 being driven by a belt which runs in engagement with a pulley, 26, that is carried by the shaft.

Two vertical standards, 30, are secured to the case or bed-plate 10, the upper ends of said standards being formed with shoulders 31, beneath which there are arranged inwardly-extending projections 32, which ride in vertical end recesses that are formed in a U-shaped bar, 33, said bar constituting one section of the outer wall of the feed-box of the machine, the other section of the outer wall of the feed-box being shown at 34, the two sections being united by screws 2, as probably best shown in Fig. 9.

Spiral springs 35 are arranged between the shoulders 31 and the curved bar 33, these springs acting to hold the feed-box down in yielding contact with the disk 14.

The section 34 of the feed-box is provided with a series of angular plates, 3, all of said plates being bent at an angle, as best shown in Figs. 2 and 9, these bends being made at a point so that as the disk 14 is revolved an aperture, 4, that is formed in the disk will pass directly beneath the bends. The purpose of this formation will be presently explained. Within the aperture 4 of the disk 14 there is arranged a bushing, 5, said bushing being preferably made of hardened steel.

Within the tubes 16 and 17 there are arranged compressing-plungers 38 and 39, which said plungers are held against turning within the tubes by outwardly-extending projections or pins 6, the points of these plungers registering with the central bore or aperture of the

bushing 5, so that the plungers may be advanced to enter said bore or aperture.

In connection with the lower plunger I arrange a ring or way, 40, that is broken away in two places, adjustable cam-blocks 41 and 41^a being arranged at the points where the ring is so broken away, the cam-blocks being supported by coiled springs 42^a, that are coiled about threaded shanks 42, said shanks being engaged by nuts 43, this construction being best shown in Figs. 1 and 3. The upper compressor-plunger is normally upheld above the feed-box by the engagement of its pin 6 with a ring, 44, that is supported by the standards 30, said ring being broken away, as best shown at *a* in Fig. 2, one end of the ring being bent down to form a cam-face, *b*.

In connection with the parts described I arrange a hammer, 45, that is carried by the long arm of a lever, 46, said lever being mounted between the arms of the double standard 25. The short arm of the lever 46, which extends downward between the arms of the standard 25, carries a friction-roller, 47, which is best shown in dotted lines in Fig. 1, and this roller 47 is borne upon by a cam, 48, that is keyed to the shaft 24. The lower edges of the parts employed to form the feed-box are faced with leather or rubber, as indicated at 7 in the drawings.

Such being the general construction of the machine, the operation is as follows: The material to be compressed into tablets is delivered to the disk 14 within the feed-box, and the shaft 24 is started forward, so as to drive the disk in the direction of the arrow shown in connection therewith in Fig. 2, the lower compressing-plunger, 39, being at this time held in the position in which it is shown in Fig. 6, so that as the disk revolves beneath the feed-box the material will be delivered to the bore of the bushing 5, and a complete filling of the opening above the top of the plunger 39 will be insured. The cam 41^a is adjusted so that as the lower end of the plunger 39 reaches a point approximately beneath a point marked *c* in Fig. 2 it will act to force the said plunger upward to the position in which it is shown in Fig. 5, the vertical throw of the cam being adjusted so as to regulate the amount of material retained within the aperture of the bushing 5 above the plunger 39, all excess of material which is forced outward above the face of the disk 14 being intercepted and held by the outer section, 33, of the feed-box. After passing from engagement with the cam 41^a, the plunger 39 will drop back to the position in which it is shown in Fig. 8, and just as the plunger 39 arrives at a position beneath the hammer 45 the cam 48 will permit the hammer to drop, and the upper plunger, 38, will be forced downward to the position in which it is shown in Fig. 8, the material contained within the bore or aperture of the bushing 5 being compressed into the form of a tablet. Then, as the disk 14 continues its revolution, the plunger 39 will be forced upward by the action of the

cam-block 41, and the tablet will be thrown out upon the disk 14, this movement taking place at the time when the plunger 39 is about beneath the point marked *d* in Fig. 2.

In Fig. 4 I illustrate a construction wherein the use of the hammer 45 is dispensed with, the plungers 38 and 39 being forced together by the action of wheels or rollers 50, that are arranged as clearly shown in the figure referred to. In Fig. 11 I illustrate a construction wherein the sleeve 13 is provided with several sets or series of plunger supporting arms. If the machine is so arranged, it will of course be understood that the cam 48 (if a hammer is employed) would be differently arranged and timed.

The form of machine illustrated in Fig. 4 is particularly applicable for use in the manufacture of lozenges or other tablets that are made from powders of a sticky or adhesive nature.

In order that the force blow of the hammer 45 may be varied, I arrange a spring, 49, in connection with the lever 46, the tension of this spring being adjusted to suit the requirements of the case by means of a screw, 8, that is engaged by an adjusting-nut, 9, the parts being arranged as shown in Fig. 1.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a tablet-compressing machine, the combination of an apertured disk, a feed-box held in yielding contact with the disk, plungers secured to the disk and registering with the aperture or apertures therein, and means for revolving the disk and plungers and for forcing the plungers together, substantially as herein shown and described.

2. In a tablet-compressing machine, the combination, with an apertured revoluble disk, of a feed-box arranged above the disk, angular plates carried by the feed-box and extending inward over the face of the disk, plungers mounted to register with the disk-aperture, and a means, substantially as described, for forcing the plungers together, as and for the purpose stated.

3. In a tablet-compressing machine, a feed-box formed of two sections, 33 and 34, bolted together, the section 34 being provided with the angular plates 3, substantially as herein shown and described.

4. In a tablet-forming machine, the combination, with a vertical shaft and a means for revolving the same, of a sleeve keyed to the shaft, an apertured disk carried by the sleeve, vertically-slotted tubes, also carried by the sleeve, a feed-box arranged above the disk, plungers mounted within the tubes carried by the sleeve and arranged to register with the disk-aperture, adjustable cams arranged in connection with the lower plunger, a pin carried by the upper plunger and projecting outward through the slot of the tube within which the plunger is mounted, a broken ring formed with a cam-face and arranged in the path of

the pin of the upper plunger, and a means, substantially as described, for forcing the plungers together, as and for the purpose stated.

5 5. In a tablet-compressing machine, the combination, with a vertical shaft and its support, of a sleeve, 13, carried by said shaft, a disk, 14, carried by the sleeve, a bushing, 5, fitted within the disk, tubes 16 and 17, carried by the sleeve 13, plungers 38 and 39, arranged within the tubes, standards 30, formed with projections 32, a feed-box made up of outer sections, 33 and 34, the section 33 being formed with vertical slots to receive the projections 32, springs 31, a broken ring, 44, formed with a cam-face, 15 b, a ring, 40, provided with adjustable cam-sections 41 and 41^a, a hammer, 45, a hammer-

supporting lever, 46, a cam, 48, a spring arranged in connection with the hammer, and a driving mechanism, substantially as described.

6. In a tablet-compressing machine, the combination, with a revolving apertured disk and plungers, of the feed-box arranged above the disk and provided with recesses, upwardly-projecting standards provided with shoulders and with inwardly-extending projections fitting in the recesses of the feed-box, and springs interposed between the shoulders and feed-box, substantially as herein shown and described. 20 25

HARRY H. JONES.

Witnesses:

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CHAS. A. BAILEY.